Remarks

Reconsideration of this Application is respectfully requested.

Claims 1-5 and 8-21 are pending in the application, with claims 1 and 11 being the independent claims.

Based on the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding rejections and that they be withdrawn.

Telephonic Interview

Applicants and Applicants' representative wish to thank Examiner Michelle Lay for the telephonic interview with the Applicants' representative, Mr. Timothy A. Doyle, on April 5, 2007.

During the interview, Applicants' representative explained the present invention and distinguished it from U.S. Patent No. 5,808,617 to Kenworthy *et al.* (hereinafter "Kenworthy"). Particularly, Applicants' representative explained that Kenworthy is directed to rendering a frame with a processor by temporal compositing through a multi-pass process. In contrast, the present invention is directed to rendering a frame with multiple graphics pipelines by spatial compositing through parallel processing.

Rejections Under 35 U.S.C. § 103

Claims 1-5 and 8-21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,808,617 to Kenworthy. (*See* Office Action at p. 2.) Applicants respectfully traverse these rejections.

Each of independent claims 1 and 11 recites, *inter alia*, (emphasis added) "wherein said ***graphics pipelines*** are configured to render the frame by ***spatial compositing*** through ***parallel processing***." These features are supported throughout the specification of the instant patent application and particularly at paragraphs 0013 through 0016, which state (emphasis added):

> The use of multiple processors in computer graphics hardware not only enables stages in a graphics pipeline to be processed simultaneously, but also allows for additional ***graphics pipelines for parallel processing***. Graphics architectures have utilized these additional pipelines to process succeeding frames of images to support changes in a scene with time. . . . . Another type of compositing, called spatial compositing, also marks a major advancement in computer graphics performance. Like temporal compositing, spatial compositing relates to an approach to optimizing the utilization of multiple graphic units, and thus multiple pipelines. *Rather than having each graphics unit or pipeline render an entire frame or a sequence of frames and having the output of each graphics unit combined temporally,* ***spatial compositing uses each graphics unit to render a portion of each overall frame*** *and combines the output of each graphics unit spatially with respect to the location of the rendered portion within the overall frame.* By reducing the amount of graphics data (which may include geometry data) communicated to each graphics unit, spatial compositing increases the rate at which an overall frame is rendered.

These features are also particularly supported at paragraph 0040 of the instant patent application, which states (emphasis added):

> The present invention relates to an approach to optimizing the utilization of multiple graphics units, and thus multiple pipelines. *Rather than having each pipeline render an entire frame of a sequence of frames and*

> *having the output of each pipeline combined temporally,* ***spatial compositing uses each pipeline to render a portion of each overall frame*** *and combines the output of each pipeline spatially with respect to the location of the rendered portion within the overall frame.* By reducing the amount of graphics data that each processor must act on, spatial compositing increases the rate at which an overall frame is rendered.

Kenworthy does not disclose, teach, or suggest graphics pipelines configured to render a frame with graphics pipelines by spatial compositing through parallel processing. Rather, ***Kenworthy*** discloses rendering a frame with **a *processor by temporal compositing through a multi-pass process***. The Office Action recognizes that Kenworthy discloses temporal compositing rather than spatial compositing. Specifically, at page four, the Office Action states (emphasis added):

> The system of Kenworthy further teaches the use of double buffering, which enables the system ***to generate one display list while it reads another***. As the system calculates the gsprite transforms and build the display list for one frame, it reads the display list for another frame and displays the image data in this list. Because of the double buffering, the image preprocessor performs steps (280-286) shown in Fig. 6, for one frame, which the image processor performs steps (290-298) for another frame [col. 15, lines 23-32].

Furthermore, column 8, lines 44-56, states (emphasis added):

> Chunking provides several significant advantages. The use of chunking provides an effective form of compression. ***Since all the geometry in one chunk is rendered before proceeding to the next***, the depth buffer need only be as large as a single chunk. By using a relatively small chunk size such as 32x32 pixels, the depth buffer can be implemented directly on the graphics rendering chip. This eliminates a considerable amount of memory, and also allows the depth buffer to be implemented using a specialized memory architecture which can be accessed with very high bandwidth and cleared during double buffer operations, eliminating the traditional frame buffer memory clearing overhead between frames.

Thus, independent claims 1 and 11 are patentable over Kenworthy. Because each of claims 2-5, 8-10, and 12-21 depend upon claims 1 or 11 and because of the individual distinctive features of claims 2-5, 8-10, and 12-21, these claims are also patentable over Kenworthy.

Therefore, Applicants respectfully request that the Examiner reconsider claims 1-5 and 8-21 and remove the rejections of these claims under 35 U.S.C. § 103(a).

Conclusion

All of the stated grounds of rejection have been properly traversed. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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